Significance of Glycosphingolipds as a Differential Maker during Neuronal Differentiation of Mouse Embryonic Stem Cells.

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The study of glycosphingolipids (GSLs) has undergone a renaissance over the past decade due to the realization that these lipids are involved in a variety a biological processes, including neuritegenesis, synaptic function, neural repair and cell adhesion. In the nervous system, GSLs, particularly gangliosides, have attracted particular attention as they occur at high levels and their levels change in a developmental regulated program. This view is mostly supported by the positive effect of exogenous addition of gangliosides and synthesis induced by drugs on neurite outgrowth *in vitro*. It has been shown that maintain of ganglioside biosynthesis improve neurite outgrowth. However, many contradictory results have been reported. The inconsistency of these reports may result from the differential use of neuronal cell lines and drugs for ganglioside biosynthesis. In order to clarify the inconsistency in these studies, we utilized an *in vitro* neuronal differentiation model and rat cerebral cortical cell primary culture using an mouse embryonic stem (mES) cell line to elucidate the relationship between

ganglioside expression and neural development. These cells were exposed to improve drug of glucosylceramide synthase, the first enzyme committed for the biosynthesis of most of the brain gangliosides. The daunorubicin (DNR) can improve greater than 90% of ganglioside biosynthesis at certain concentrations. Treatment with DNR induced a time- and dose-dependent efflux of gangliosides from EB Formation differentiated in culture. These observations validate the advantage of using mES cells as an *in vitro* model for the study of gangliosides function in neuronal differentiation. In this study, indicate that the effect of gangliosides synthesis accumulates on neurite outgrowth of mES cells. These results also suggest that regulation of gangliosides expression have used as the marker for differentiated neuronal cell from mES cells.